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Jet Propulsion Laboratory
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EDUCATION

- Ph.D. *Atmospheric Science* (2009)
Colorado State University, Fort Collins, Colorado
Dissertation: ‘*Relationships Between Aerosol, Cloud, and Precipitation as Observed from the A-Train Constellation of Spaceborne Sensors*’
Co-Advisors: Prof. Graeme Stephens and Prof. Christian Kummerow
- M.S. *Atmospheric Science* (2005)
Colorado State University, Fort Collins, Colorado
Thesis: ‘*Modeling Polarized Radiances Towards an Aerosol Retrieval Method*’
Advisor: Prof. Graeme Stephens
- B.A. *Physics (Major), Mathematics (Minor)* (2002)
The Colorado College, Colorado Springs, Colorado

POSITIONS

- Jet Propulsion Laboratory, Pasadena, CA
• Scientist III, Climate Physics Group (2011-Present)
- Department of Atmospheric Science, Colorado State University
• Research Scientist (2009-2011)
• Graduate Research Assistant (2003-2009)
• Graduate Teaching Assistant, Atmospheric Radiation (Spring 2007, Spring 2009)

AWARDS

- CSU Atmospheric Science Alumni Award: For outstanding research by a senior PhD student (2009)
- Outstanding Student Paper Award (AGU Fall Meeting) (2008)
- NASA Earth and Space Science Fellowship (NESSF) (2007-2009)
- Ball Aerospace Fellow, Colorado State University (2003-2005)

RESEARCH INTERESTS

- Remote Sensing of Clouds, Precipitation and Aerosol
- Global Climate and Energetics
- Aerosol-Cloud-Precipitation Interactions

PEER REVIEWED PUBLICATIONS

In Review

Millan, L., M. **Lebsock**, N. Livesey, S. Tanelli, and G. Stephens, Differential absorption radar techniques –Part 1: Surface pressure. *Atmos. Meas. Tech. Discuss.*, **7**, 5795–5827, 2014, doi:10.5194/amtd-7-5795-2014.

In Press

Kalmus, P., M. **Lebsock**, J. Teixeira, Observational Boundary Layer Energy and Water Budgets of the Stratocumulus-to-Cumulus Transition, *J. Climate*, in press.

2014

Lebsock, M. and H. Su (2014), Application of Active Spaceborne Remote Sensing for Understanding Biases Between Passive Cloud Water Path Retrievals. *J. Geophys. Res. Atmos.* **119**, 8962-8979, DOI: 10.1002/2014JD021568.

Behrangi, A., G. Stephens, R.F. Adler, G.J. Huffman, B. Lambrigtsen, M. **Lebsock** (2014), An Update on the Oceanic Precipitation Rate and Its Zonal Distribution in Light of Advanced Observations from Space. *J. Climate*, **27**, 3957–3965. doi: <http://dx.doi.org/10.1175/JCLI-D-13-00679.1>

Smalley, M., T. L'Ecuyer, M. **Lebsock**, J. Haynes (2014), A Comparison of Precipitation Occurrence from the NCEP Stage IV QPE Product and the CloudSat Cloud Profiling Radar. *J. Hydrometeor*, **15**, 444–458. doi: <http://dx.doi.org/10.1175/JHM-D-13-048.1>

2013

Lebsock, M., H. Morrison, and A. Gettelman (2013), Microphysical implications of cloud-precipitation covariance derived from satellite remote sensing, *J. Geophys. Res. Atmos.*, **118**, doi:10.1002/jgrd.50347.

Suzuki, K., G.L. Stephens, and M.D. **Lebsock** (2013), Aerosol effect on the warm rain formation process: Satellite observations and modeling, *J. Geophys. Res. Atmos.*, **118**, 170–184, doi:10.1002/jgrd.50043.

Rapp, A.D., M.D. **Lebsock** and T.S. L'Ecuyer (2013), Low cloud precipitation climatology in the southeastern Pacific marine stratocumulus region using CloudSat. *Environ. Res. Lett.* **8**, 014027, doi:10.1088/1748-9326/8/1/014027.

Christensen, M. W., G. L. Stephens, and M. D. **Lebsock** (2013), Exposing biases in retrieved low cloud properties from CloudSat: A guide for evaluating observations and climate data, *J. Geophys. Res. Atmos.*, **118**, 12,120–12,131, doi:10.1002/2013JD020224.

2012

Behrangi, A., M. **Lebsock**, S. Wong, and B. Lambrigtsen (2012), On the quantification of oceanic rainfall using spaceborne sensors, *J. Geophys. Res.*, **117**, D20105, doi:10.1029/2012JD017979.

Boening, C., M. **Lebsock**, F. Landerer, and G. Stephens (2012), Snowfall-driven mass change on the East Antarctic ice sheet, *Geophys. Res. Lett.*, **39**, L21501, doi:10.1029/2012GL053316.

Stephens, G.L., J. Li, M. Wild, C.A. Clayson, N. Loeb, S. Kato, T. L'Ecuyer, P.W. Stackhouse, M. **Lebsock**, T. Andrews. (2012), An Update on the Earth's energy balance in light of new surface energy flux estimates., *Nature Geosci.* 5, 691–696, doi:10.1038/ngeo1580.

Wood, R., D. Leon, M. **Lebsock**, J. Snider, and A. D. Clarke (2012), Precipitation driving of droplet concentration variability in marine low clouds, *J. Geophys. Res.*, 117, D19210, doi:10.1029/2012JD018305.

2011

Lebsock, M.D., and T.S. L'Ecuyer (2011), The retrieval of warm rain from CloudSat, *J. Geophys. Res.*, 116, D20209, doi:10.1029/2011JD016076

Lebsock, M.D., T.S. L'Ecuyer, and G.L. Stephens (2011), Detecting the ratio of rain and cloud water in low-latitude shallow marine clouds, *J. Appl. Meteor. Clim.*, 50, 419-432, doi:10.1175/2010JAMC2494.1

2010

Sorooshian, A., G. Feingold, M. D. **Lebsock**, H. Jiang, G. L. Stephens (2010), Deconstructing the Precipitation Susceptibility Construct: Improving Methodology for Aerosol-Cloud-Precipitation Studies, *J. Geophys. Res.*, 115, D17201, doi:10.1029/2009JD013426.

Lebsock, M.D., C. Kummerow, G.L. Stephens (2010), An Observed Tropical Oceanic Radiative-Convective Cloud Feedback, *J. Climate*, 23, 2065-2078, doi:10.1175/2009JCLI3091.1.

2009

Sorooshian A., G. Feingold, M.D. **Lebsock**, H. Jiang, G.L. Stephens (2009), On the precipitation susceptibility of clouds to aerosol perturbations, *Geophys. Res. Lett.*, 36, L13803, doi:10.1029/2009GL038993.

Rapp, A.D., M. **Lebsock**, C. Kummerow (2009), On the consequences of resampling microwave radiometer observations for use in retrieval algorithms, *J. Appl. Meteor. Clim.*, 48, 1981-1993, doi: 10.1175/2009JAMC2155.1.

L'Ecuyer, T. S., W. Berg, J. Haynes, M. **Lebsock**, and T. Takemura (2009), Global observations of aerosol impacts on precipitation occurrence in warm maritime clouds, *J. Geophys. Res.*, doi:10.1029/2008JD011273.

2008

Lebsock, M.D., G.L. Stephens, and C. Kummerow (2008), Multisensor satellite observations of aerosol effects on warm clouds, *J. Geophys. Res.*, 113, D15205, doi:10.1029/2008JD009876.

Stephens, G.L., D.G. Vane, S. Tanelli, E. Im, S. Durden, M. Rokey, D. Reinke, P. Partain, G.G. Mace, R. Austin, T. L'Ecuyer, J. Haynes, M.D. **Lebsock**, K. Suzuki, D. Waliser, D. Wu, J. Kay, A. Gettleman, Z. Wang, R. Marchand (2008), The CloudSat Mission: Performance and early science after the first year of operation, *J. Geophys. Res.*, 113, D00A18, doi:10.1029/2008JD009982.

2007

Lebsock, M.D., T.S. L'Ecuyer, and G.L. Stephens (2007), Information content of near-infrared spaceborne multiangular polarization measurements for aerosol retrievals, *J. Geophys. Res.*, 112, D14206, doi:10.1029/2007JD008535.

BOOK CHAPTERS

Lebsack, M.D and S. Cooper, ‘Cloud Properties’, in Encyclopedia of Remote Sensing, Ed. Eni Njoku, Springer, 2013

PRESENTATIONS

CONFERENCES (ORAL)

CloudSat Science Team Meeting, Paris, France, August 2012

AGU Fall Meeting, San Francisco, CA, December 2011

AMSR-E Science Team Meeting, Asheville, NC, July 2011

CloudSat Science Team Meeting, Montreal, Canada, June 2011

A-Train symposium (Data Users Workshop), New Orleans, LA, October 2010

IEEE IGARRS, Honolulu, HI, July, 2010

AMS 13th Conference on Atmospheric Radiation, Portland, OR, June 2010

AMSR-E Science Team Meeting, Huntsville, AL, June 2010

AGU Fall Meeting, San Francisco, CA, December 2009

CERES Science Team Meeting, Fort Collins, CO, November 2009

AGU Fall Meeting, San Francisco, CA, December 2008

CloudSat Science Team Meeting, Seattle, WA, August 2008

12th International Symposium on Remote Sensing, Bruges, Belgium, September 2005

CONFERENCES (POSTER)

AGU Fall Meeting, San Francisco, CA, December 2013

AGU Fall Meeting, San Francisco, CA, December 2012

Pan-GASS, Boulder, CO, September 2012

Chapman conference on remote sensing of the terrestrial water cycle, Kona, HI, February, 2012

Gordon radiation conference, Colby, ME, June, 2011

A-Train Symposium, New Orleans, Louisiana, October 2010

INVITED SEMINARS

ECMWF Workshop on Parameterization of clouds and precipitation across model resolutions, Reading, England, November, 7, 2012

NASA Goddard Space Flight Center, Greenbelt, MD, September 8, 2010

NASA Jet Propulsion Lab, Pasadena, CA, May 28, 2010

UNDERGRADUATE STUDENTS ADVISED

- Francisco Miranda – Fall 2013
- Maziyar Boustiani – Summer 2012

PROFESSIONAL ACTIVITIES

- Organizing committee: CloudSat/Calipso science team meeting, Paris France, 2012

- Instructor: JPL Climate Sciences summer school, 2012
- Member: American Meteorological Society (2003 - Present)
- Member: American Geophysical Union (2011 - Present)
- CloudSat Algorithm Developer Working Group (2009 - Present)
- Mission Scientist, NASA IPHEx field campaign, Asheville, NC (May 2014)
- Flight Scientist, NASA LPVEx field campaign, Turku, Finland (Fall 2010)
- Peer Reviewer
 - Journal of Geophysical Research*
 - Journal of Quantitative Spectroscopy and Radiative Transfer*
 - Journal of Applied Meteorology and Climatology*
 - Journal of Hydrometeorology*
 - Journal of the Atmospheric Sciences*
 - Atmospheric Chemistry and Physics*
 - Journal of Climate*
 - Geophysical Research Letters*
 - Nature*
- Proposal Panel Reviewer
 - DOE*
 - NASA*